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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,739	08/10/2001	Yoshiaki Tatsumi	PI01160-00017	6659

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EXAMINER

KITOV, ZEEV

ART UNIT PAPER NUMBER

2836

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/925,739

Applicant(s)

TATSUMI ET AL.

Examiner

Zeev Kitov

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 7, 9, 13 - 17 is/are rejected.
- 7) ☒ Claim(s) 8, 10 - 12, 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

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## DETAILED ACTION

1. Examiner acknowledges a submission of the amendment and arguments filed on July 03, 2003. Claims 6 and 7 are amended. New claims 13 – 19 are added.

Amendment and arguments have overcome some rejections under 102 (b) and 103(a).

However, new ground for rejection was found. The rejection follows.

### ***2. Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

a) Claims 1, 3, 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arasawa et al. (US 5,547,539) in a view of Chen et al. (US 5,691,876). Arasawa et al. discloses most of the elements of the claim including a laminated structure electrostatic chuck being formed by a first and a second insulation layers (element 20 in Fig. 8A), and electrode layer (element 19 in Fig. 8A) and a second insulation layer (second element 20 in Fig. 8A) on a metal substrate (susceptor, element 14, in Fig. 8A), wherein the insulation layers are made of polyamide films (col. 4, lines 26 – 33). Though he mentions an electrostatic chuck adhesively bonded to the upper portion of susceptor

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but he does not disclose the adhesion performed by thermoplastic polyamide based film having specified thickness.

Chen et al. discloses at least one adhesive layer located between the metal substrate and the first insulation layer made by using thermoplastic polyamide based film (col. 6, line 34 – col. 7, line 16). A thickness of the adhesive layer is 12 microns, which is in claimed range. Both patents have the same problem solving area, namely providing efficient and reliable electrostatic chuck structure. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the thermoplastic polyamide film adhesive layer according to Chen et al. in the electrostatic chuck of Arasawa et al., because as Chen et al. states (col. 6, line 34 – col. 7, line 16), the thermoplastic polyamide based film has advantage over acrylic based adhesives in its ability to withstand temperatures above 175<sup>0</sup>.

Regarding Claim 3, Arasawa et al. discloses the metal substrate made of an aluminum alloy (col. 4, lines 3 – 8).

Regarding Claim 4, Arasawa et al. discloses the insulation layer as the polyamide film having thickness of 10 – 100  $\mu\text{m}$ .

Regarding Claims 13, Chen et al. discloses the thermoplastic polyimide-based adhesive film as a siloxane modified adhesive film (col. 10, line 60 – col. 11, line 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further the Arasawa invention by adding the siloxane-modified polyamic acid as a polyimide precursor, because as Chen et al. state (col. 3,

lines 47 –63, col. 10, line 60 – col. 11, line 16), the obtained film has advantages of high thermal and low thermal expansion.

b) Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arasawa et al. in a view of Chen et al. and further in a view of Matsunaga et al. (US 5,645,921). As was stated above, Arasawa et al. and Chen et al. disclose all the elements of Claim 1. However, regarding Claim 2, they do not disclose a second adhesion layer.

Matsunaga et al. disclose an electrostatic chuck having two insulation layers (elements 4a and 4b in Fig. 4), an electrode layer (element 3a in Fig. 4), and three adhesive layers (elements 2a, 2b and 2c in Fig. 4, col. 1, lines 44 – 67, col. 2, lines 1 – 6); the polyamide-based adhesive films have a thickness of 10 – 50  $\mu\text{m}$  (col. 2, lines 4 – 6). All the reference patents have the same problem solving area, namely providing efficient electrostatic chuck equipment. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used multiple adhesive layers as cited by Matsunaga et al., because as Matsunaga et al. state (col. 2, lines 31 – 32), the adhesive layers are used for laminating chick composite materials.

c) Claims 5 - 7, 9, 10, 14 - 17 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Tomaru et al. (US 6,071,630) in a view of Chen et al. Regarding Claim 5, Tomaru et al. disclose most of the elements of the claim, including a step in which a thermoplastic polyamide-based adhesive film with thickness of 25  $\mu\text{m}$  (col. 12, Table 3), a polyamide films used as a first and second insulation layers (both insulation

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layers are made of thermally conductive silicon rubber, see an Abstract), and the second thermoplastic polyamide-based adhesive film with thickness of 25  $\mu\text{m}$  (col. 12, Table 3) are sequentially superimposed on metal substrate and followed by a low-temperature compression bonding at a temperature of 120<sup>0</sup>C (col. 8, lines 58 – 61) sequentially laminating the first insulation layer, the electrode layer and the second insulation layer on the metal surface (col. 8, lines 42 – 67). Tomaru further discloses a metal foil constituting an electrode layer (col. 12, Table 3). However, Tomaru does not disclose a thermoplastic polyimide-based adhesive.

Chen et al. discloses at least one adhesive layer located between the metal substrate and the first insulation layer made by using thermoplastic polyamide based film (col. 6, line 34 – col. 7, line 16). A thickness of the adhesive layer is 12 microns, which is in claimed range. Both patents have the same problem solving area, namely providing efficient and reliable electrostatic chuck structure. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the thermoplastic polyamide film adhesive layer according to Chen et al. in the electrostatic chuck of Tomaru et al., because as Chen et al. states (col. 6, line 34 – col. 7, line 16), the thermoplastic polyamide based film has advantage in its ability to withstand temperatures above 175<sup>0</sup>.

Regarding Claim 6, Tomaru et al. disclose a manufacturing method including a step of forming the electrode layer on one side surface of a second insulation layer by plating means (col. 8, lines 42 – 53), a step in which a thermoplastic polyamide-based adhesive film with a thickness of 10  $\mu\text{m}$ , a polyamide film constituting the first insulation

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layer, a thermoplastic polyamide-based adhesive film with a thickness of 10  $\mu\text{m}$ , an electrode layer, a thermoplastic polyamide-based adhesive film with a thickness of 10  $\mu\text{m}$  and a polyamide film constituting the second insulation layer are sequentially superimposed on a metal substrate, and a step in which a low-temperature compressing bonding pressing is performed at a heating temperature of 120<sup>0</sup> C under pressure so as to form a laminated structure (col. 8, lines 42 – 67, col. 9, lines 33 – 49).

As per Claim 7, in addition to manufacturing steps disclosed in previous claims and rejected accordingly it recites a limitation of a low-temperature compression bonding performed at a heating temperature of 100 – 250<sup>0</sup>C under pressure. Tomaru discloses the low-temperature compression bonding performed at a heating temperature of 120<sup>0</sup>C under pressure of 0.1 kg/cm<sup>2</sup> (col. 11, lines 21 – 44). Even though in Example 4, a quartz sheet was used as a first insulating layer, the general procedure of Example 4 was repeated in Comparative Example 1, wherein the first insulating layer is the polyimide film with thickness of 10  $\mu\text{m}$  (col. 12, lines 1 – 35).

Regarding Claim 9, Tomaru et al. discloses the metal substrate made of aluminum (col. 8, line 54).

Regarding Claim 10, Tomaru et al. discloses the polyamide film having thickness of 10  $\mu\text{m}$ .

Regarding Claims 14 - 17, Chen et al. discloses the thermoplastic polyimide-based adhesive film as a siloxane modified adhesive film (col. 3, lines 59 – 60, col. 10, line 60 – col. 11, line 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further the Arasawa invention by

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adding the siloxane-modified polyamic acid as a polyimide precursor, because as Chen et al. state (col. 3, lines 47 –63, col. 10, line 60 – col. 11, line 16), the obtained film has advantages of high thermal and low thermal expansion.

d) Claim 18 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Tomaru et al. in a view of Chen et al. and further in a view of Court Decision *In re Aller*, 105 USPQ 233. As was stated above, Tomaru et al. and Chen et al. disclose all the elements of Claims 5 and 6. As per Claim 18 requiring the adhesive film having thickness of 20  $\mu\text{m}$  to 50  $\mu\text{m}$ , Chen et al. disclose an adhesive with a thickness of 12  $\mu\text{m}$  and further change of the thickness is a mere an optimization of dimensions. Regarding an optimization of working parameters, the Court Decision states that discovering an optimum value of a result effective variable doe not represent an inventive step. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Tomaru solution by increasing the adhesive thickness from 12  $\mu\text{m}$  to 20 – 50  $\mu\text{m}$ , since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

### **3. Allowable Subject Matter**

Claims 8, 10 - 12 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.



#### ***4. Response to Arguments***

An Applicant Response regarding Claims 1, 3 and 4 rejection is moot in a view of a new ground for rejection.

#### ***5. Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeev Kitov whose telephone number is (703) 305-0759. The examiner can normally be reached on 8:00 – 4:30. If attempts to reach examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (703) 308-3119. The fax phone numbers for organization where this application or proceedings is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Z.K.  
09/08/2003



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